

REMARKS

In this Response claims 2, 3, 6, 8, 9, 12, 13, 16, 19, 20, 27, 34 – 36, and 37 have been amended; claims 4, 7, 15, 18, 30 – 33, and 38 have been cancelled without prejudice; and claims 39 and 40 have been added. Support for these amendments is found throughout the originally filed specification.

Claims 2, 3, 6, 8 – 14, 16, 19 – 23, 25, 27, 34 – 37, 39, and 40 are pending.

Claim Rejections – 35 USC 112

Claims 4 and 18 – 23 are rejected under 35 USC 112, second paragraph, as being indefinite. Specifically, it is alleged that it is contradictory to have a further limitation that requires different surfaces to be on the same surfaces. The Applicants have presented cancellations and amendments that clarify the claim language.

Accordingly, Applicants respectfully request that this rejection be withdrawn.

Claim Rejections – 35 USC § 102

In the Office Action claims 2, 3, 6 – 8, 11, 12, 25, 27, 34, and 37 are rejected under § 102(e) as being anticipated by Pokharna (US 6,801,430) (hereinafter “Pokharna”).

Claim 7 has been cancelled without prejudice rendering its rejection moot.

Claim 34 has been amended to recite a standardized peripheral apparatus comprising:

- a board;
- an integrated circuit coupled to the board;
- a case, encasing the integrated circuit and the board, having a form factor including a plurality of external dimensions compatible with a Personal Computer Memory Card International Association (PCMCIA) standard having a plurality of specifications governing the form factor and the external dimensions; and
- a thermal management arrangement including
 - a vent on the case to at least facilitate an exhaust of heat convectively emitted from the integrated circuit into an ambient, and
 - a jet actuator coupled to the board to provide an air current to at least facilitate the exhaust of the convectively emitted heat through the vent.

As can be seen, claim 34 recites a standardized apparatus having a case compatible with a PCMCIA standard and a thermal management arrangement including a jet actuator.

Pokharna teaches a thermal management arrangement in a host device (e.g., a laptop). There is no teaching, express or inherent, that the device of Pokharna may be a device compatible with the PCMCIA standard as recited in claim 34. Accordingly, an anticipation rejection based on this reference is inappropriate.

Furthermore, there is nothing in Pokharna to suggest that the thermal management arrangement of the host device may be extended to a PCMCIA compatible device. Claim 34 represents an embodiment developed by the inventors to provide a high heat transfer thermal management arrangement within the small form factor constraints associated with the PCMCIA standards. The prior art small form factor cards either fail to provide effective thermal management arrangements or modify the form factor of the case such that it ceases to comply with the constraints of the governing standard. Thus, the embodiment claimed in claim 45 represents a unique thermal management solution for small form factor peripheral devices.

Pokharna, as discussed above, deals with a host device, where forced air thermal management systems are common. Host devices do not have the same challenges with respect to power consumption, size constraints, and operating environment constraints that small form factor peripheral devices encounter. It is these challenges that the prior art has been incapable of overcoming. It is these challenges that are addressed by the unique solution presented in the teachings of embodiments of the present invention.

For at least these reasons claim 34 is patentable over this cited reference.

Claims 2, 3, 6, 8, 11, 12, 25, 27, and 37 depend from, or include limitations similar to, claim 34. Therefore, these claims are also patentable over this cited reference.

Claim Rejections – 35 USC § 103(a)

Claim 4 is rejected under 35 USC § 103(a) as being unpatentable over Pokharna in view of Katooka et al. (US 5,424,915) (hereinafter “Katooka”). Claim 4 has been cancelled without prejudice rendering this rejection moot.

Claims 9 – 10, 13 – 16, and 35 are rejected under 35 USC § 103(a) as being unpatentable over Pokharna.

Claim 15 has been cancelled without prejudice rendering its rejection moot.

The remaining claims ultimately depend upon claim 34. Therefore these claims are patentable over Pokharna for at least the above given reasons. These claims also add additional points of novelty such as, but not limited to,

- a partition orthogonally connected to the board; and
- the inlet vent in the first air flow chamber and the outlet vent in the second air flow chamber.

In the Office Action, claims 30 – 33, 36, and 38 are rejected under 35 USC § 103(a) as being unpatentable over Suzuki et al. (US 6,031,718) (hereinafter “Suzuki”) in view of Pokharna.

Claims 30 – 33, and 38 have been cancelled without prejudice rendering their rejections moot.

Claim 36, as amended, recites a standardized peripheral apparatus comprising:

- a board;
- an integrated circuit coupled to the board;
- a case compatible with a Personal Computer Memory Card International Association (PCMCIA) standard, encasing the integrated circuit and the board, having
 - an outlet vent disposed on a first portion of a surface of the case to facilitate exhaust of heat convectively emitted from the integrated circuit, into an ambient; and
 - an inlet vent disposed on a second portion of the surface of the case, to facilitate an intake of air from the ambient;
- a jet actuator disposed inside the case, to at least facilitate an air flow over the integrated circuit in a general direction from the inlet vent to the outlet vent; and
- a connector, to directly couple the standardized peripheral apparatus to a host device in a substantially rigid relationship.

The embodiment of Suzuki depicted in Fig. 17 is alleged to have all of the elements of pre-amended claim 36 except for a flow generating device. Pokharna is relied upon to teach this missing element.

Above amendments are presented to clarify that in this claimed embodiment the inlet and outlet vents are disposed on the same surface. Because neither Pokharna nor Suzuki teach, suggest, or imply this element, claim 36 is patentable over this combination.

Claims 18 – 23 are rejected under 35 USC § 103(a) as being unpatentable over Suuzki in view of Pokharna and further in view of Katooka et al. (US 5,424,915) (hereinafter “Katooka”).

With respect to claim 18, the Examiner stated that the combination of Suzuki, Pokharna, and Katooka disclose all of the elements including that the inlet and outlet vents are on the same surface. While 18 has been cancelled without prejudice, rendering this rejection moot, this asserted combination will be discussed with respect to claim 36, to which claims 19 – 23 are ultimately dependent.

There is insufficient motivation to combine these references in a manner to make claim 36, as a whole, obvious. Pokharna teaches a mobile computing device. Katooka teaches a power supply device. Suzuki teaches an IC card. Without the benefit of the teachings of the current application, one skilled in the art would not have the motivation or direction required to successfully modify the IC card of Suzuki to include the flow generating device of Pokharna implemented with the airflow plan (including inlet and outlet on same surface) of Katooka.

The motivation for the airflow plan of Katooka lies in the fact that power supply devices are arranged with chambers in a vertically stacked orientation. The lower chamber has devices that do not generate heat. The upper chamber includes devices that generate heat, some of which may be conductively transferred to the lower chamber. The small amount of heat from the lower chamber does not justify having its own flow generating device. Therefore, the flow generating device used for the upper chamber is also utilized to provide airflow through the bottom chamber. Thus, the

motivation for including the vents on the same surface lies in the desire for cooling the two chambers with one device.

Suzuki, on the other hand, only includes one chamber that includes the heat generating components. Therefore, there is nothing to motivate modifying Suzuki to include an inlet and an outlet on the same surface as was done in Katooka.

In the present application, the novel features of providing the inlet vent and the outlet vent on the same surface allows for operation of the peripheral apparatus within confined operating environments, e.g., when the peripheral apparatus is inserted into a host. This may facilitate the intake and exhaust being directed towards areas of the ambient that can disperse the heat, e.g., into an internal airflow of the host or outside of the host.

The Examiner makes a reference to one being motivated to co-locate inlet and outlet vents on the same surface when the remaining surfaces are blocked by the operating environment. However, there is nothing in Suzuki or the art in general to identify this blockage as a problem for which a solution would be desirable. In fact, the airflow arrangements presented in Suzuki are assumed to be sufficiently functional without said co-location of vents. Furthermore, there is nothing in Katooka that would suggest that the co-location of vents is for the purposes of addressing this blockage problem. As discussed above, this co-location of vents is to address a different problem altogether.

For at least these reasons, combination of the cited references in the proposed manner is improper. Therefore, claim 36 is patentable over these references.

Claims 19 – 23 depend from claim 36 and are patentable over these references for at least the same reasons as given above.

New Claims

Claims 39 and 40 have been added. These claims depend on claims 34 and 36, respectively. Accordingly, these claims are patentable over the cited references for at least the reasons given above with respect to the underlying claims.

Conclusion

Applicant respectfully submits that the claims 2, 3, 6, 8 – 14, 16, 19 – 23, 25, 27, 34 – 37, 39, and 40 are presented in allowable form. Accordingly, a withdrawal of remaining rejections and issuance of a Notice of Allowance is respectfully requested.

If the Examiner has any questions, he is invited to contact the undersigned at (503) 796-2972.

The Commissioner is hereby authorized to charge shortages or credit overpayments to Deposit Account No. 500393.

Respectfully submitted,
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